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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/955,368	09/18/2001	Harish Viswanathan	16	8345

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EXAMINER

MEEK, JACOB M

ART UNIT PAPER NUMBER

2637

DATE MAILED: 07/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/955,368

Applicant(s)

VISWANATHAN, HARISH

Examiner

Jacob Meek

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 - 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 April 2005 and 12 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see 9 -16, filed 4/13/05, with respect to the rejection(s) of claim(s) 1 - 22 under 35 USC 102 and 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Whinnet (US-6,317,411).

Drawings

2. The drawing was received on 4/13/05. This drawing is accepted.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1, 6 –10, 14 – 20, and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Whinnett et al (US Patent 6,317,411).

With regard to claim 1, Whinnett discloses a method for use in a system to transmit four transmit sequences (see figure 5, 20 output and column 6, lines 17 – 26 where this is interpreted as equivalent) over at least four antennas (see Figure 5, 100, 102, 104, 106) comprising the step of space – time coding at least two pairs of symbols substreams to form a respective pair of transmit sequence chains (see Figure 5, 88 & 90 inputs and column

5, lines 36 – 49 where this is interpreted as being equivalent) where the space-time coding is such that at least on the formed pairs is a function of a respective pair (see Figure 5, 88 & 90 outputs, where S_1S_2 , and S_3S_4 , create unique from other pairs formed) and not a function of other pairs.

With regard to claim 6, Whinnett discloses coding a first pair of symbol substreams (see figure 5, 82 where this is interpreted as equivalent) to form a first transmit stream that is not a function of second symbol pair (see figure 5, 84), and coding a second pair of symbol substreams to form a second transmit stream that is not a function of first symbol pair (see figure 5, 84 where this is interpreted as equivalent).

With regard to claim 7, Whinnett teaches the transmission of at least one of the transmit sequence chains on one the respective antennas (see Figure 5, 100, 102, 104, 106 and column 6, lines 23 – 34).

With regard to claim 8, Whinnett teaches the spreading of symbols of transmit sequence chains using a spreading code (see Figure 5, 92 & 94 and column 6, lines 28 – 29).

With regard to claim 9, Whinnett teaches the channel coding of a least 4 data streams, and mapping each of the channel coded data streams to produce symbol sub streams (see column 5, lines 17 - 26).

With regard to claims 10, and 14, Whinnett discloses an apparatus utilizing the method of claims 1, and 8 respectively, as claimed above and therefore it would have been obvious considering the aforementioned rejection for the method claims 1, and 8.

With regard to claim 15, Whinnett discloses a transmitter with an input (see Figure 5, 20 where encoded traffic channel source is interpreted as having a non-encoded data input), at least one channel encoder (see Figure 5, 20) between input and space-time encoder (see

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Figure 5, 88 & 90 where transformer is interpreted as equivalent functionality) the channel encoder to channel code a data substream (see column 1, lines 41 - 54).

With regard to claim 16, Whinnett discloses an Encoded and Interleaved Traffic Channel Data Source (see figure 5, 20 and column 1, lines 40 – 49 which is interpreted as providing equivalent functionality).

With regard to claim 17 and 18, Whinnett discloses his transmitter system is useful for CDMA, and utilizes base and mobile stations (see column 1, lines 17 – 35).

With regard to claim 19, Whinnett discloses a plurality of radio frequency units (see Figure 5, 92, 96 & 98 and column 6, lines 35 – 43 where this is interpreted as equivalent) having an coupled to output of space time encoder (see Figure 5, 88 & 90) each radio frequency unit being adapted to convert baseband to RF.

With regard to claim 20, Whinnett discloses a receiver with at least one antenna (see Figure 7, 120) and a matrix multiplier for multiplying received symbol streams having at least two pairs of consecutive rows (see figure 7, 128 & 130 and column 6, line 61 – column 7, line 3 where this is interpreted as providing equivalent functionality).

With regard to claim 22, Whinnett discloses his invention is useful for combating fading (see column 1, lines 27 – 40).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2 – 5, 11 – 13, and 21 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Garmonov.

With regard to claim 2, Whinnett teaches that each transmit sequence has a duration of four symbol periods (see Figure 5, $S_1S_2S_3S_4$ where this is interpreted as equivalent).

Whinnett teaches a method of transmitting each transmit sequence of a particular transmit sequence chain is a function of a symbol of one of the symbol streams (see Figure 5, 88 and 90 outputs). Whinnett discloses substream pairs are complex conjugates and portions of the four transmit sequence chains are representable by a where each row of a matrix represents one transmit sequence of a different one of the transmit sequence chains (see column 6, lines 7 – 21) and each column represents a symbol period (see column 6, lines 7 – 21 where this is interpreted as equivalent). Applicant's claimed invention appears to be an obvious variation of the orthogonal technique and would have been obvious to one of ordinary skill in the art (see column 12, lines 58 – 63).

With regard to claim 3, Whinnett teaches his matrix is orthogonal (see column 6, lines 7 – 21 where this is interpreted as an orthogonal matrix).

With regard to claim 4, Whinnett discloses a matrix (see column 6, line 7 -21). Whinnett discloses that there are alternative embodiments (see column 12, lines 58 –63). Therefore it would have been obvious to one of ordinary skill of the art at the time of invention to utilize alternative orthogonality schemes based on Whinnett's disclosure that a variety of embodiments could be utilized.

With regard to claim 5, Whinnett discloses a matrix (see column 6, line 7 -21). Whinnett discloses that there are alternative embodiments (see column 12, lines 58 –63). Therefore it would have been obvious to one of ordinary skill of the art at the time of invention to utilize

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alternative orthogonality schemes based on Whinnett's disclosure that a variety of embodiments could be utilized.

With regard to claims 11 and 12, Whinnett discloses an apparatus utilizing the method of claims 2, and 3, as claimed above and therefore it would have been obvious considering the aforementioned rejection for the method claims 2, and 3.

With regard to claim 13, Whinnett discloses an apparatus utilizing the method of claims 4, and 5, as claimed above and therefore it would have been obvious considering the aforementioned rejection for the method claims 4, and 5.

With regard to claim 21, Whinnett discloses the receive matrix is provides an inverse transform to transmit matrix (see column 11, lines 44 – 56) and therefore is analyzed as claims 4 and 5 above.

Other Cited Prior Art

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. NPL references are cited as state of knowledge, Jalloul et al (Performance analysis of CDMA transmit diversity methods) in particular seems to disclose relevant aspects of applicant's invention.

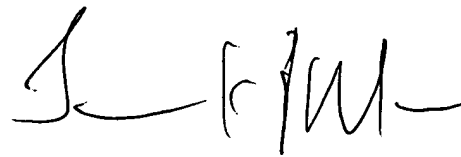
Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob Meek whose telephone number is (571)272-3013. The examiner can normally be reached on 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571)272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JMM

A handwritten signature in black ink, appearing to be 'JMM' with a stylized flourish.A handwritten signature in black ink, appearing to be 'J K Patel' with a stylized flourish.

JAY K. PATEL
SUPERVISORY PATENT EXAMINER